

## WHAT IS CLAIMED IS:

1. A gas laser including two elongated slab electrodes arranged face-to-face defining a gap therebetween, the electrodes being located in an enclosure containing a laser gas at reduced pressure, the laser gas filling the gap between the slab electrodes, the laser being energized by applying electrical power across the slab electrodes thereby igniting a first gas discharge in the laser gas between the electrodes, the laser further comprising:

first and second spaced apart ionizer electrodes;

a dielectric jacket surrounding and sealing said electrodes, said jacket

including a recess disposed between said electrodes, said jacketed electrodes extending into the enclosure at a location spaced from said slab electrodes; and

a circuit for applying RF power to said dielectric-jacketed ionizer electrodes in order to create a second gas discharge in said space between said ionizer electrodes, said second gas discharge providing ions in the laser gas and thereby facilitating ignition of said first gas discharge.

2. The laser of claim 1, wherein said first and second ionizer electrodes are rectangular electrodes arranged face-to-face, and said space therebetween is correspondingly rectangular.

3. The laser of claim 1, wherein said first dielectric-jacketed ionizer electrode is in the form of a post, said second dielectric-jacketed ionizer electrode is annular and surrounds said first dielectric-jacketed ionizer electrode and with the recess in the dielectric jacket being correspondingly annular.

4. The laser of claim 1, wherein said dielectric-jacketed ionizer electrodes extend into the enclosure for a distance between about 5.0 and 8.0 millimeters.

5. The laser of claim 1, wherein said dielectric material of the jacket surrounding said ionizer electrodes has a minimum thickness greater than about 0.5 millimeters.

6. The laser of claim 1, wherein said recess in the jacket has a width between about 0.5 and 1.5 millimeters.

7. The laser of claim 1, wherein said dielectric jacket surrounding said ionizer electrodes is formed from a material that is not corroded by said gas discharge.

8. The laser of claim 7, wherein said dielectric jacket material is a ceramic material.

9. The laser of claim 8, wherein said dielectric jacket material is an alumina ceramic.

10. The laser of claim 1, wherein said secondary gas discharge at least partially surrounds said dielectric-jacketed electrodes.

15

11. A preionizer for a gas laser including two elongated slab electrodes arranged face-to-face defining a gap therebetween, the electrodes being located in an enclosure containing a laser gas at reduced pressure, the laser gas filling the gap between the slab electrodes, the laser being energized by applying electrical power across the slab electrodes thereby igniting a discharge in the laser gas between the electrodes, the preionizer comprising:

a pair of spaced apart ionizer electrodes extending into the enclosure; and  
a ceramic jacket surrounding and sealing said electrodes from the laser gas,  
said jacket having a recess extending inwardly from the outer surface thereof, said recess being located in the space between the ionizer electrodes so that when said ionizer electrodes are energized, the laser gas located in the recess will become ionized thereby facilitating the ignition of the laser discharge.

12. The preionizer of claim 11, wherein said ionizer electrodes are rectangular electrodes arranged face-to-face, and said space therebetween is correspondingly rectangular.

30

13. The preionizer of claim 11, wherein one of said ionizer electrodes is annular in shape and surrounds the other ionizer electrode and with the recess in said jacket being substantially annular.

5

14. The preionizer of claim 11, wherein said ionizer electrodes extend into the enclosure for a distance between about 5.0 and 8.0 millimeters.

15. The preionizer of claim 11, wherein said ceramic material of the jacket  
10 surrounding said ionizer electrodes has a minimum thickness greater than about 0.5 millimeters.

16. The preionizer of claim 11, wherein recess in the jacket has a width between about 0.5 and 1.5 millimeters.

15